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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,475	04/01/2004	Barry L. Gregerson	AccuTech - Carrier Tape	6366

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EXAMINER	
EWALD, MARIA VERONICA	

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1791	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/815,475	GREGERSON ET AL.	
	Examiner	Art Unit	
	MARIA VERONICA D. EWALD	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *24 June 2008 and 09 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-21 and 30-58* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *34-50* is/are allowed.

6)☒ Claim(s) *1-21,30-33 and 51-54* is/are rejected.

7)☒ Claim(s) *55-58* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *01 April 2004 and 03 August 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *7/9/08*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

13. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 30 is rejected under 35 U.S.C. 102(b) as being anticipated by Atake (U.S. 6,325,607). Atake teaches an apparatus for automatically embossing carrier pockets in a continuous strip of plastic material to form a carrier tape by a process including the steps of automatically positioning successive uniform increments of the step between a pair of opposing selectively positionable heating contact surfaces, momentarily contacting the strip with the contact surfaces so as to heat a region of the increment to a forming temperature, positioning the increment so that the heated region is between a male mold member and a female mold member, and engaging the region with the male and female mold members to form the pocket, the apparatus including a heat shield assembly adapted to selectively interpose a heat shield, simultaneously, between each contact surface and the strip when the process is paused, thereby preventing heat damage to the strip resulting from excessive heat transfer between the contact surfaces and the strip (item 85 – figure 8; column 10, lines 55 – 65).

With respect to claim 30, the Examiner is noting that the phrase "an apparatus….to form the pocket," which precedes the transitional language "the

apparatus including," is part of the preamble, and is a recitation of intended use. The structural elements which are essential to the claim itself are the element(s) *proceeding* the transitional language, which includes the heat shield. However, to the extent that the preamble is given weight, with respect to understanding the scope of the invention, the Examiner is also noting that the apparatus of Atake is capable of functioning as recited in the preamble, since the apparatus of Atake is a thermoforming machine, with a preheater, and a heat shield, whereby a sheet or strip of plastic material is fed to the preheater and subsequently to the thermoforming machine which includes male and female mold portions. Per MPEP 2111, "during examination, statements in the preamble reciting the purpose or intended use of the claimed invention must be evaluated to determine whether the recited purpose or intended use results in a structural difference (or, in the case of process claims, manipulative difference) between the claimed invention and the prior art. If so, the recitation serves to limit the claim. See, e.g., In re Otto, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963).

Claim Rejections - 35 USC § 103

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 10 – 12 and 15 – 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atake (U.S. 6,325,607) in view of Fuji (U.S. 5,571,473), further in

view of Mutti, et al. (U.S. 4,778,372) and further in view of Greiwe, et al. (U.S. 5,385,465).

Atake teaches an apparatus for automatically embossing carrier pockets in a continuous strip of plastic material to form a carrier tape, the apparatus comprising: a guide structure for positioning and guiding the strip in the apparatus (item 50 – figure 2); a drive assembly adapted to selectively engage and feed the strip through the guide structure in a sequence of uniform increments (item 60 – figure 2; column 5, lines 10 – 20; column 13, lines 15 – 20); a heating assembly (item 4 – figure 1; column 4, lines 45 – 50); a heat shield assembly arranged to selectively interpose a heat shield between the heating assembly and the strip (item 85 – figure 8; column 10, lines 55 – 65); and a molding assembly for molding the heated region into a pocket, the molding assembly including a pair of mold portions (items 12 and 25 – figure 1; column 5, lines 55 – 65) selectively contactable with the at least one pocket region, the pair of mold portions including a male mold portion (item 25 – figure 1) and a corresponding female mold portion (item 12 – figure 1); wherein there is an indexing assembly for accurately positioning the strip in the guide structure (item 55 – figure 1; column 11, lines 60 – 67); wherein the strip of plastic material is wound on a reel, and further comprising a feed control mechanism to selectively feed the strip to the drive mechanism from the reel (item R – figure 1; column 11, lines 60 – 67; column 12, lines 1 – 20). In the apparatus of Atake, a plastic strip is unwound from the reel (item R – figure 1) and fed to the sheet holding mechanism which indexes and moves the sheet forward onto an endless belt and drive assembly (items 50 and 60 – figure 1), which drives the sheet to the molding

station. The drive assembly is comprised of pinch chucks which are disengageable from the sheet when the sheet enters the mold. Furthermore, the sheet is clamped within the mold for molding, once disengaged from the drive assembly (column 12, lines 20 – 30). Atake also teaches control system operatively connected to control the drive, heating, heat shield, and molding assemblies, respectively (column 3, lines 15 – 20; column 4, lines 3 – 5; column 9, lines 45 – 65).

Atake, however, does not specifically teach that the heating assembly is adapted to heat at least one region on each increment of the strip, the heating assembly including a selectively positionable portion adapted to apply heat to the strip at the at least one region, the portion being positionable in a retracted position spaced apart from the strip. Atake also does not teach the presence of a punching assembly having at least one punch pin arranged to be selectively contactable with the pocket, wherein the punch pin has a shaft with a head portion defined at a distal end thereof, the head having a first cross-sectional dimension, the shaft further having a portion with a second cross sectional dimension adjacent the head portion, the second cross-sectional dimension being less than the first cross-section dimension. Furthermore, Atake does not teach that the guide structure is a stationary guide structure.

With respect to the heat assembly, it is known, however, to include a retractable heat assembly which moves vertically towards and away from the sheet to heat the sheet on both its top and lower surfaces. For example, in a thermoforming apparatus, Fujii teaches a preheating assembly and a molding assemby for a sheet which is indexed from a reel (figure 1). The preheating assembly is comprised of heating plates

(items 32 – 34 – figure 1), which have heating faces directly contacting the parts of the sheet to be formed, without contacting peripheral portions, which are not to be molded (column 3, lines 1 – 10). This suggests a heat assembly with portions adapted to apply heat to the strip in one region. However, Fujii, like Atake, fails to teach retractable portions. Fujii also fails to teach the inclusion of a punch assembly.

In a thermoforming apparatus, Mutti, et al. teach the use of upper and lower heating plates which may be retractable vertically relative to contacting the sheet (item 1 – figure 1). This adjustment allows a contact pressure with the sheet and occurs via a hydraulic or pneumatic mechanism (column 5, lines 45 – 50). This suggests, retractable portions of the heating assembly, which are adapted to apply heat to the strip in one region. Furthermore, Mutti, et al. teach a punching assembly to punch out the pocket or depression formed. The punch assembly is comprised of a shaft with a head portion defined at a distal end thereof, wherein the cross-sectional dimensions of the shaft are less than that of the head assembly (item 5' – figure 6; column 8, lines 5 – 30).

Like, Atake, however, Fujii and Mutti, et al. both fail to teach a stationary guide structure. Such a modification is well within the level of one of ordinary skill in the art of thermoforming. For example, Greiwe, et al. teach a vertical thermoforming apparatus, wherein a bulk sheet is conveyed from a roller to a molding station. A stationary guide structure (item 30 – figure 1) is positioned beneath or upstream of the molding apparatus to guide the sheet into the molding station (column 5, lines 48 – 50).

Thus, Atake teaches a thermoforming apparatus, but without a retractable heating assembly with portions contacting the strip in specific regions. Fujii teaches a

thermoforming apparatus, with a heating assembly comprised of protruding plates which contact and heat specific portions of the sheet. Mutti, et al. teach the use of retractable heating plates to ensure thorough heating of the sheet and also teaches the use of a punch assembly to knock-out the individual pockets formed. In addition, Greiwe, et al. teach a stationary guide structure to feed the sheet to the molding apparatus.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Atake with the heated contact portions of Fujii, further configured such that the heating assembly is retractable and with a punch assembly, as taught by Mutti, et al. and configured with a stationary guide structure, as taught by Greiwe, et al. for the purposes of guiding the sheet to the molding station and for heating only the portions of the sheet which are to be deformed and for ensuring thorough heating of such portions, while also punching out the individual pockets formed.

Claims 2 – 4 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atake, in view of Fujii, in view of Mutti, et al., in view of Greiwe, et al. and further in view of Arends, et al. (U.S. 5,939,107). Atake, Fujii, and Mutti, et al., and Greiwe, et al. teach the characteristics previously described but do not teach that the drive assembly includes a drive roller and a friction roller, wherein the friction roller is selectively positionable and wherein the drive roller is driven by a servomotor. The above references also fail to teach that the guide structure is oriented vertically so that the strip passes through the heating assembly in a generally vertically path. This however, is

merely, changing the position of the structural elements but does not change the function of the elements. See In re Japikse, 181 F.2d 1019, 86 USPQ 70 (CCPA 1950) (Claims to a hydraulic power press which read on the prior art except with regard to the position of the starting switch were held unpatentable because shifting the position of the starting switch would not have modified the operation of the device); In re Kuhle, 526 F.2d 553, 188 USPQ 7 (CCPA 1975). Furthermore, it is known to one of ordinary skill in the art that a vertical preheater can be used to heat a sheet prior to thermforming.

With respect to the use of the rollers, such means are used to support and move the sheet and are known in the art of thermoforming sheets. For example, in a thermoforming apparatus, Arends teaches the use of opposed pairs of rollers to guide and drive a sheet from a reel (item 26 – figure 2). The sheet (item 12 – figure 2) is engaged with pairs of rollers (items 42 and 48 – figure 2), which are disengageable from a sheet-holding position (column 5, lines 1– 15). Furthermore, the drive roller is driven by a servomotor (column 5, lines 35 – 38). Thus, the use of disengageable rollers allows not only the sheet to be clamped between the rollers, but also in the retracted position, allows any corrections to the sheet or threading of the sheet onto the apparatus or reel (column 5, lines 15 – 18). In addition, Arends teaches that the conveyance of the sheet from the reel through the drive rollers and subsequently to the heater occurs in generally a vertical path prior to the thermoforming apparatus. The preheater itself is oriented vertically, while the drive rollers and guide rollers are also oriented vertically with respect to each other, thereby pulling the sheet in the vertical direction.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Atake, with the elements of Fujii, Mutti, et al. and Greiwe, et al. further configured with the rollers and the vertical orientation of the rollers and preheater of Arends, et al. for the purpose of engaging the sheet, thereby moving it through the apparatus and disengaging from the sheet, to allow threading of the sheet onto the reel or any corrections to the apparatus operation.

Claims 5 – 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atake, in view of Fujii, in view of Mutti, et al., in view of Greiwe, et al. and further in view of Ekendahl, et al. (U.S. 6,659,758). Atake, Fujii, Mutti, et al., and Greiwe, et al. teach the characteristics previously described but do not teach that the strip of plastic material has at least one series of uniformly spaced sprocket holes, wherein the molding assembly has a plurality of pilot pins adapted to be selectively engageable with the sprocket holes. It is noted, however, that the primary reference of Atake already teach that the sheet is disengageable from the pinch chucks when the sheet is indexed into the mold assembly and clamped therebetween. Thus, Atake is also teaching means within the mold assembly which clamps and holds the sheet in place during molding (item 20 – figure 1; column 12, lines 20 – 30).

In a method to clamp and index a sheet through a thermoforming apparatus, Ekendahl teaches that clamping means can be comprised of a belt conveyor system gripped on both sides by pins attached to a chain (column 5, lines 1 – 5). Similarly, a reciprocating shuttle that grips the sheets along the edges can be used (column 5, lines

5 – 8). Ekendahl also teaches that other means can be used, such as mechanical frames which attach to holes in the sheet (column 5, lines 15 – 20). Thus, such means as claimed by Applicant are like those described by Ekendahl, which are means to grip and convey the sheet through the apparatus.

Therefore, the primary reference of Atake teaches a clamper or clamping means which engages the sheet in the molding apparatus. Ekendahl teaches a variety of gripping and transferring means such as pins gripping the sheet on both sides or the use of mechanical frames which register with holes in the plastic sheet. Though Atake may not teach the specific clamping means, Ekendahl already teaches a plastic sheet with holes to register with a mechanical frame of which such an assembly functions as that as claimed by Applicant. Such an assembly serves the purpose of clamping the sheet and conveying it through the molding apparatus.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Atake with the structural elements of Fujii, Mutti, et al. and Greiwe, et al. further configured with the gripping structure of Ekendahl, comprised of a mechanical frame assembly corresponding to holes in the sheet for the purpose of gripping and transferring the sheet through the molding apparatus.

Claims 7 – 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atake, in view of Fujii, in view of Mutti, et al., in view of Greiwe, et al. and further in view of Desnick (U.S. 3,642,411). Atake, Fujii, Mutti, et al. and Greiwe, et al. teach the

characteristics previously described but do not teach that the heat shield assembly includes a body portion and a pair of spaced apart shield plate portions projecting therefrom, the shield plate portions adapted to be selectively positionable so that each shield member is disposed between the strip and a separate contact portion of the heating assembly, wherein the heat shield includes a pair of air diffusers in the body portion, each diffuser positioned so as to direct air onto a surface of a separate one of the shield plate portions.

In a thermoforming apparatus, Desnick teaches the use of heat shield members (items 115 and 116 – figure 8), which cover upper and lower portions of the sheet which are not be contacted or molded. The heat shield members further include passages to cool the heat shield members (column 6, lines 40 – 50), such that cooling fluid is circulated through the passages.

The primary reference of Atake already teaches the use of a heat shield, while both Fujii and Mutti, et al. teach upper and lower heating assemblies. It is noted that the heat shield of Atake is movable between a retracted position and a forward position, wherein in the forward position, the shield prevents the sheet from further heating, should the apparatus operation be ceased, thereby preventing any warpage of the sheet (column 10, lines 50 – 65). Desnick teaches upper and lower heat shield assemblies which can be cooled via circulating fluid through its passages. Thus, because Atake already teach the use of a heat shield and both Fujii and Mutti, et al. teach upper and lower heating plates, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Atake,

with the elements of both Fujii and Mutti, et al., configured with the stationary guide of Greiwe, et al. further modified with the upper and lower heat shield plates of Desnick for the purpose of preventing any temperature increase in the sheet which may cause sheet warpage, should the apparatus operation be discontinued.

Claim 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atake, in view of Fujii, in view of Mutti, et al., in view of Greiwe, et al. and further in view of Dupraz (U.S. 5,437,546). Atake, Fujii and Mutti, et al. and Greiwe, et al. teach the characteristics previously described but do not teach the presence of an air curtain as a heat shield. The use of an air curtain is merely to cool the sheet and deter any increased temperature rise, which may cause warpage of the sheet. Thus, it would have been obvious to implement an air curtain as the shield.

For example, in an apparatus to cool an extruded film or foil, Dupraz teaches the use of an air curtain which is discharged from a slit of a tubular body (column 4, lines 50 – 60). The use of the air curtain and the control of the air flow deters any curling of the sheet (column 5, lines 50 – 54). Thus, the quality of the sheet is maintained.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Atake with the elements of Fujii, Mutti, et al. and Greiwe, et al. with the air curtain of Dupraz for the purpose of preventing any warpage of the sheet and maintaining its quality.

Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atake in view of Fujii, in view of Mutti, et al., in view of Greiwe, et al., further in view of Ekendahl and Wheaton, III, et al. (U.S. 3,706,517). Atake, Fujii, Mutti, et al. and Greiwe, et al. teach the characteristics previously described but do not teach that the plastic sheet has at least one series of uniformly spaced sprocket holes and wherein the indexing assembly includes a ball detent mechanism. As noted previously, Atake already teaches an indexing means for moving the sheet and the use of a ball detent mechanism corresponding to sprocket holes in the sheet are merely another type of indexing means and is obvious to one of ordinary skill.

For example, in a method to clamp and index a sheet through a thermoforming apparatus, Ekendahl teaches that clamping means can be comprised of a belt conveyor system gripped on both sides by pins attached to a chain (column 5, lines 1 – 5). Similarly, a reciprocating shuttle that grips the sheets along the edges can be used (column 5, lines 5 – 8). Ekendahl also teaches that other means can be used, such as mechanical frames which attach to holes in the sheet (column 5, lines 15 – 20). Thus, such means as claimed by Applicant are like those described by Ekendahl, which are means to grip and convey the sheet through the apparatus.

In addition, in a rotating turret used to transfer work pieces between stations, Wheaton, III, et al. teach the use of a rotating crank arm (item 78 – figure 2), to which a flag (item 76 – figure 2) is attached. The flag is rotated and firmly seated on the crank arm via a ball detent and spring mechanism (item 140 – figure 8). The ball detent and spring mechanism ensures the flag member is held securely during rotation and

indexing. Furthermore, the crank arm and flag are indexed from one position to another to engage the turret head, thereby indexing it from one station to another. In the apparatus of Wheaton, III, et al., the turret is indexed in an injection blow molding machine with three or more work stations, wherein the preforms are first formed and subsequently processed (column 2, lines 15 – 20).

Thus, Atake, Fujii, Mutti, et al. and Greiwe, et al. teach thermoforming apparatus, wherein a plastic sheet is conveyed through a series of stations. Atake also teaches that there are indexing means for the sheet. Ekendahl teaches the use of many types of conveying or indexing means for the plastic sheet, of which one type of means is the use of holes in the sheet which engage mechanical frames. In a rotating turret, Wheaton, III, et al. teach indexing means wherein a flag is secured to a rotating crank arm, causing the turret to index from one station to another, wherein the flag is secured to the crank arm via a ball detent mechanism. Therefore, because each of the above references teaches some type of indexing means for conveying a work piece, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Atake with the elements of Fujii, Mutti, et al., Greiwe, et al. and Ekendahl, further configured with the ball detent mechanism of Wheaton, III, et al. for the purpose of conveying and indexing the sheet through the work stations.

Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atake in view of Fujii, in view of Mutti, et al. in view of Greiwe, et al., further in view of Ekendahl

and Oster, et al. (U.S. 6,380,549). Atake, Fujii, Mutti, et al. and Greiwe, et al. teach the characteristics previously described but do not teach that the plastic sheet has at least one series of uniformly spaced sprocket holes and wherein the indexing assembly includes a light sensor to register the sprocket holes. As noted previously, Atake already teaches an indexing means for moving the sheet and the use of a light sensor corresponding to sprocket holes in the sheet are merely another type of indexing means and is obvious to one of ordinary skill in the art.

For example, in a method to clamp and index a sheet through a thermoforming apparatus, Ekendahl teaches that clamping means can be comprised of a belt conveyor system gripped on both sides by pins attached to a chain (column 5, lines 1 – 5). Similarly, a reciprocating shuttle that grips the sheets along the edges can be used (column 5, lines 5 – 8). Ekendahl also teaches that other means can be used, such as mechanical frames which attach to holes in the sheet (column 5, lines 15 – 20). Thus, such means as claimed by Applicant are like those described by Ekendahl, which are means to grip and convey the sheet through the apparatus.

With respect to the use of light sensor, Oster, et al. teach the use of a light sensor to detect pin-holes in foils, such that the light sensor is aligned with the holes.

Thus, Atake, Fujii, Mutti, et al. and Greiwe, et al. teach thermoforming apparatus, wherein a plastic sheet is conveyed through a series of stations. Atake also teach that there are indexing means for the sheet. Ekendahl teaches the use of many types of conveying or indexing means for the plastic sheet, of which one type of means is the use of holes in the sheet which engage mechanical frames. Oster, et al. teach the use

of a light sensor which registers or detects pin holes in foils. Therefore, because each of the above references teaches some type of indexing means for conveying a work piece, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Atake with the elements of Fujii, Mutti, et al., Greiwe, et al. and Ekendahl, further configured with the light sensor of Oster, et al. for the purpose of conveying and indexing the sheet through the work stations.

Claims 17 – 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atake in view of Fujii, in view of Mutti, et al., in view of Greiwe, et al. and further in view of Straumanis (U.S. 3,904,338). Atake, Fujii, Mutti, et al. and Greiwe, et al. teach the characteristics previously described but do not teach the specific control system as claimed, wherein there is an automatic operating mode and a pause mode.

In a method to control thermoforming of an extruded sheet, Straumanis teaches the use of a control system and sensors which monitor the thermoforming operation and control the conveyance of the sheet to the thermoformer, such that in an intermittent mode, an accumulator is used to take up the slack, such that the extruded sheet is not warping or becoming damaged if it sags, while waiting to be conveyed to the thermoformer (column 2, lines 50 – 65). The thermoforming apparatus of Straumanis includes an intermittent-activated process, wherein the sheet is indexed through the preheater and subsequently to the mold (column 5, lines 40 – 50). The control system of Straumanis incorporates the use of sensors and a dancer roll (item 23 – figure 23),

which synchronizes the indexing of the sheet to the thermoformer from the extruder, such that the sheet is adequately fed to the thermoformer without sacrificing throughput and damage to the sheet, should operation stop or slow down (column 6, lines 6 – 50). Thus, the control system of Straumanis suggests a control system functioning like that of Applicant, wherein the control system defines a normal automatic mode and a selectable pause mode, wherein the strip is held stationary, the portion is positioned in the retracted position and the heat shield is positioned between the portions and the strip, wherein there is a synchronizing assembly arranged to receive embossed carrier tape from the apparatus, the synchronizing assembly including a pair of sensors, a first sensor of said pair being arranged to generate a signal when the amount of carrier tape present in the synchronizing assembly is in excess of a first predetermined amount and a second sensor of said pair being arranged to generate a signal when the amount of carrier tape present in the synchronizing assembly is less than a second predetermined amount, wherein each of the pair of sensors is operably connected with the control system, and wherein the control system is adapted to automatically initiate the pause mode when the amount of carrier tape present in the synchronizing assembly is in excess of the first predetermined amount and to automatically initiate the normal automatic operating mode when the amount of carrier tape present in the synchronizing assembly is less than a second predetermined amount.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Atake with the elements of Fujii, Mutti, et al. and Greiwe, et al. further configured with the control system of Straumanis

for the purpose of effectively conveying the strip or sheet through the preheater and molding stations, such that any pause in the operation, is registered by the apparatus and varies the speed or slack of the sheet, such that any portion of the sheet not yet molded, is not warped or damaged at any point in the operation.

Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atake in view of Fujii, in view of Mutti, et al. in view of Greiwe, et al. and further in view of Fritz, et al. (U.S.6,257,866). Atake, Fujii, Mutti, et al. and Greiwe, et al. teach the characteristics previously described but do not specifically teach that the female mold portion has an opening defined therein, the opening selectively operably connected with a supply of compressed gas, and wherein a stream of compressed gas is selectively directed from the opening against the strip to urge the strip against the male mold. However, the use of compressed gas is known to one of ordinary skill in the art of thermoforming, whether used to expel gas onto the sheet surface to urge it against the mold or used as a vacuum to hold the sheet against a mold surface.

For example, in a thermoforming apparatus, Fritz, et al. teach the use of a upper and lower platens (items 16 and 18 – figure 1), in which both platens have vacuum and air pressure sources connected to them urging the sheet against the mold form (item 14 – figure 1). Initially, the plastic sheet is heated to its pliant state, allowing it to be molded. To ensure it does not sag, a vacuum source is operated to maintain the sheet against the heating plate (item 50 – figure 1). Subsequently, the air pressure source is activated to urge the sheet against the bottom platen and thereby against the mold

(column 4, lines 25 – 40, 45 – 55). Thus, the use of the air flow ensures that the sheet is pressed firmly against the mold form and adequately shaped.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Atake with the elements of Fujii, Mutti, et al. and Greiwe, et al. further configured with the air pressure source of Fritz, et al. for the purpose of ensuring that the sheet is firmly pressed against the mold form and thus, adequately shaped.

Claims 31 – 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atake in view of Desnick. Atake teaches the characteristics previously described but do not teach that the heat shield assembly includes a body portion and a pair of spaced apart shield plate portions projecting therefrom, the shield plate portions adapted to be selectively positionable so that each shield member is disposed between the strip and a separate contact portion of the heating assembly, wherein the heat shield includes a pair of air diffusers in the body portion, each diffuser positioned so as to direct air onto a surface of a separate one of the shield plate portions.

In a thermoforming apparatus, Desnick teaches the use of heat shield members (items 115 and 116 – figure 8), which cover upper and lower portions of the sheet which are not be contacted or molded. The heat shield members further include passages to cool the heat shield members (column 6, lines 40 – 50), such that cooling fluid is circulated through the passages.

The primary reference of Atake already teaches the use of a heat shield. It is noted that the heat shield of Atake is movable between a retracted position and a forward position, wherein in the forward position, the shield prevents the sheet from further heating should the apparatus operation be ceased, thereby preventing any warpage of the sheet (column 10, lines 50 – 65). Desnick teaches upper and lower heat shield assemblies which can be cooled via circulating fluid through its passages. Thus, because Atake already teach the use of a heat shield, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to modify the apparatus of Atake, further modified with the upper and lower heat shield plates of Desnick for the purpose of preventing any temperature increase in the sheet which may cause sheet warpage, should the apparatus operation is discontinued.

Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Atake, in view of of Dupraz. Atake teaches the characteristics previously described but do not teach the presence of an air curtain as a heat shield. The use of an air curtain is merely to cool the sheet and deter any increased temperature rise, which may cause warpage of the sheet. Thus, it would have been obvious to implement an air curtain as the shield.

For example, in an apparatus to cool an extruded film or foil, Dupraz teaches the use of an air curtain which is discharged from a slit of a tubular body (column 4, lines 50 – 60). The use of the air curtain and the control of the air flow deters any curling of the sheet (column 5, lines 50 – 54). Thus, the quality of the sheet is maintained.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Atake with the air curtain of Dupraz for the purpose of preventing any warpage of the sheet and maintaining its quality.

Claims 51 – 54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Atake, in view of Fuji, in view of Mutti, et al. and further in view of Greiwe, et al. Atake, Fujii, Mutti, et al. and Greiwe, et al. teach the characteristics previously described but do not teach that the stationary guide structure is comprised of at least a first plate and a second plate fastened together, wherein there is a channel in the first plate for receiving the continuous strip and wherein each plate has at least one slot extending through the thickness of the plate. Such a modification is within the level of one of ordinary skill in the art. Greiwe, et al., already cited, teach a stationary guide but is silent with respect to the components of the guide. Greiwe, et al., however, also teach an indexing guide which moves the sheet into the molding station. The indexing guide is comprised of jaws or plates (items 26a and 26b – figure 9) which are mounted on rods and clamped together to grip a sheet. The rods, therefore, extend through slots in the jaws themselves.

Thus, it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention to configure the apparatus of Atake with the elements of Fujii, Mutti, et al. and Greiwe, et al., further modified such that the guide structure is

comprised of the fastened plates of Greiwe, et al. for the purpose of guiding the sheet through the heating and molding stations, respectively, as taught by Greiwe, et al.

Allowable Subject Matter

15. Claims 34 – 50 are allowed. The following is a statement of reasons for the indication of allowable subject matter: Applicant argued, with respect to claim 34, that the prior art did not meet the limitation(s) which require "means for positioning and guiding the strip in the apparatus." The Examiner agrees. Based upon Applicant's invocation of 35 U.S.C. 112, 6th paragraph and a review of the prior art structure, Applicant's guide structure as disclosed in the specification are the stationary plates, fastened together, as described on page 10. Though the loop chain of Atake may perform the function of guiding the sheet, it is not an equivalent structure, because the loop chain does not perform the guiding in substantially the same way. Therefore, claims 34 – 50 are indicated allowable. Thus, the closest prior art references fail to teach or suggest, means for positioning and guiding the strip in the apparatus which, per the specification, are a lower guide plate 51a and an upper guide plate 51b secured together with fasteners, wherein the lower guide plate 51a has a channel 51d formed therein and dimensioned so that a length of carrier tape 24 is receivable in channel 51d between lower guide plate 51a and upper guide plate 51b.

In addition, claims 55 – 58 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The closest prior art references

fail to teach either alone or in combination, a stationary guide structure which includes a channel dimensioned to receive a strip in said channel, and said stationary guide structure further includes a slot into which a roller extends so as to engage the strip.

Information Disclosure Statement

16. The prior art made of record, though not relied upon, is deemed pertinent to the state of the art and thus, has been considered.

Response to Arguments

17. Applicant's arguments filed June 24, 2008 with respect to claims 30 and 34 and any dependent claims, respectively, have been fully considered but they are not persuasive. With respect to claim 30, Applicant argues that Atake merely teaches one heat shield while Applicant is claiming two. The Examiner disagrees. As written, claim 30 requires *a heat shield assembly adapted to selectively interpose a heat shield, simultaneously, between each contact surface and the strip*. The heat shield of Atake is *fully capable of being inserted between each contact surface and the strip*. As shown in Figure 8, the heat shield spans *more than one contact surface* and thus, the prior art apparatus of Atake anticipates claim 30 as written. Furthermore, by inserting the word simultaneously, Applicant has not further delineated the structure or does not further define the claim to require more than one heat shield.

With respect to claim 34, Applicant's arguments are found persuasive. Therefore, claims 34 – 50 have been indicated as allowable, per the discussion above.

With respect to claim 1, Applicant argues that the guide structure of Atake is not stationary. The Examiner agrees and thus, has cited the prior art reference of Greiwe, et al. which teach a fixed guide structure (item 30 - figure 1) disposed below the heating station and upstream of the molding station, respectively.

Conclusion

18. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARIA VERONICA D. EWALD whose telephone number is (571)272-8519. The examiner can normally be reached on M-F, 8 - 4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dr. Yogendra Gupta can be reached on 571-272-1316. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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